February 20, 1962

MEMORANDUM for Hiden T. Cox

From: Jim Aswell

Subject: Publication Version, Mr. Webb's
American Ordnance Association Address

Attached is a redraft of this extemporaneous speech, along with a copy of it as transcribed from a tape recording and edited. You may want to submit this along with the retyped version so that Mr. Webb can consider whether the editing was warranted.

I think Mr. Webb should go over the copy before it is sent to the AOA Journal for publication. Some passages on the tape were jumbled, and my reconstructions may not always convey precisely the meanings Mr. Webb wanted to put across.

Also, to avoid monotony -- not a problem when he was delivering the speech but certainly a severe one when it is read -- I have found substitutes for a great many chronically repeated words, phrases, and sentence structures.

Once more, in Bill Lloyd's absence, I'm sending this directly through you.

JW
This looks pretty good to me.
HC

cc: Mr. Lloyd through Ford Eastman
Col. R. P. Young

Draft Publication Version
Mr. Webb's January 18 address (1962)
American Ordnance Association

Distinguished Guests, Ladies, and Gentlemen:

Let me say that Washington certainly changed during the years that I lived in Oklahoma. I was a member of the American Ordnance Association when I worked in New York with the Sperry Company. I have attended meetings of the Washington Chapter. When I came here today, I expected to find a much smaller group, a group of professional and industrial people and other devoted supporters of Army Ordnance. I am simply amazed at the expansion of this organization. I suppose I should not be, after almost a year in the Space Administration.

I am even further amazed, and gratified, to see here my good friends, Senator Anderson, George Miller, Chairman of the House Committee, and several of Chairman Miller's associated on the Committee. I thought they had heard enough of me during the last session of Congress. I can

only say that if they attended to express their strong support of the program the President submitted at noon today to Congress -- and of which they have been advised in advance -- I voice my deep appreciation.

I hope that their seeing the interest of this audience in space may make our job easier in the coming session of Congress.

There has been skepticism in some quarters over whether space really is attracting the support of the American people. A number of individuals in the scientific community have expressed concern about the program that President Kennedy envisioned and boldly put forward as a task for this Nation to undertake. They have wondered if it was the right course for us.

Since Congress adjourned, I have made it a point to talk to as many of these people as possible. Chiefly, they are concerned about the general impression that our space program is spending billions directly for science.

Now, however, most of these scientists have come to understand that our main source of cost is not science but our commitment to use men in the exploration of space. This

new understanding is true of many who are actively engaged in the program, such as those in Congressman Karth's University of Minnesota -- Doctors Winkler, Nye, and ~~Near~~ NIER (?). They told me about two months ago when I was there that they had met with Dr. Van Allen of the State University of Iowa a year ago and had spent an evening discussing the space program. At that time, they had agreed that use of men in space for scientific purposes made no sense at all.

Recently, they spent another evening together, discussing the same subject. This time they concluded that space flight, even in its scientific aspects, makes no sense without men physically participating. That is how rapidly thinking has evolved among some of the most brilliant men concerned about the space program and the heavy commitment of resources it requires.

As a life member of the American Ordnance Association, perhaps you will permit me -- as my first official duty -- to set the space program in perspective.

In the period of less than a year during which I have been associated with my good friend Hugh Dryden, with other outstanding men in our Military Services, the Atomic Energy Commission, the Weather Bureau, the Federal Communications

Commission, and the National Aeronautics and Space Administration -- with men such as Ed Welsh and the Vice President in the Space Council -- nothing has become clearer than that this very large program is, indeed, helping hold together and, in many cases, build up the national industrial base to which the Ordnance Association is so devoted.

Let me point out that since President Kennedy submitted his increases in the space budget to Congress last May 25, we have let contracts for a number of quite large launch vehicles and spacecraft. Many of the contracts run into hundreds of millions of dollars, with some approaching a billion. Many will require five or six years to execute.

In every case, however, we have found that contractors who are phasing out of such programs as the B-52 and other heavy military procurement projects are eager to use in the space program the resources they have developed. They are making strong presentations that the Nation's industrial base would suffer a serious decline were the space program not here to absorb the technology and the qualified people and advanced technology beyond what the aircraft industry currently requires. In this regard, Mr. Chairman, I believe that the

space program is an essential asset.

Also for perspective, let me draw your attention to Page 39 of the President's Budget Message of today. (And, by the way, this is the first time I have seen a Budget in small book form. When I was with the Bureau of the Budget, the Message was part of a large-size book. I think the new format is a great innovation. Now you can carry it in your pocket.) At any rate, after World War II, we began to summarize in the Budget certain important phases of Government activities. The first was the natural resources program. Among the first, in 1946 or 1949, the scientific activities of the Government were summarized. This year, in Table 7 on Page 39, we have a summary of the investment, operating, and other budget expenditures for Fiscal Year 1963, which the President submitted to Congress at noon today.

Interestingly enough, in this table under "addition to Federal assets" is an item of $4,508,000,000 resulting from civilian programs of which the space program is one. Under national defense there is an item of $18,158,000,000, representing Government assets not dissipated in the annual program but remaining for continuing use and benefit to the Nation's industrial strength. Over and above the table summarizing

the physical assets, there is another table which summarizes the expenditures for other developmental purposes with values continuing beyond the year in which the programs are funded.

Again, under research and development expenditures for these developmental programs, in Fiscal Year 1963 there is a civilian item of $3,300,000,000 and a military item of $8,146,000,000. And I would like to submit that any view of the space program in perspective must take into account these continuing benefits from the military and other programs -- both in the form of physical things , in new knowledge, and in the form of brainpower.

To focus the space program still more sharply, may I refer again to Minnesota. Yesterday's Minneapolis Star had a headline that said, "House Leader Says Space Program To Pay For Itself."

I would like to read you two paragraphs quoting my good friend George Miller, Chairman of the House Space Committee. I think the quotation represents a considered judgment and indicates that the things we are doing in space are not just stunts but are part of an experimental, progressive, driving program not only to achieve space leadership but also to extract from all advanced science and technology and feed back into the growth of the Nation the kind of by-products

which historically have often proved more important in our industrial growth than the main products.

Here is what Dr. Miller says (May I call you Doctor?):

"To those who are asking, 'Why do we want to go to the moon?' -- an expedition expected to cost at least 20 billion dollars," Chairman Miller offered this answer, and I quote: "The by-products of this effort will have economic, social, and defense values far in excess of the original cost. Even at this early stage of research," he said, "it is apparent that space exploration is of such immense importance to man's total knowledge that it will benefit and alter the course of his existence in ways no more foreseeable today than those which resulted from the invention of the wheel."

That is a significant quotation. May I say that the business men in Minnesota are joining with the University people in a program to cover several states, to learn what these outstanding scientists engaged in the space program are doing, and to study regional problems in terms of what advanced space research in energy, heat transfer, new materials, metals, fabrics, electronics, communications, and the life sciences can contribute to solution of across-the-board problems.

This is an interesting undertaking, partly financed by the Ford Foundation, largely financed by the efforts of these Minnesota gentlemen themselves, and by others from surrounding states. I think it is only a beginning of a new kind of thinking about what science and technology can do toward solving our pressing national problems.

These programs help solve national defense and foreign affairs problems. They are also becoming directly applicable to what people can do about local problems at the state and community levels.

As a matter of background, all of you know that in the first half of the Twentieth Century there have been major revolutions in many aspects of world affairs. You have seen empires fall, the old system of colonialism go, and many nations arise and move in the uncertain way of newborn organisms in the complex areas of international relations.

In this same period, we have seen major political upheavals -- the Russian and the Chinese Revolutions.

We have also seen the all-encompassing scientific revolution that has produced changes spreading across the entire range of man's problems created by this panoply of forces at work in the world. During the past half century,

the United States has both moved of its own accord and been forced from a self sufficient philosophy into a position of international leadership where the play of such forces vitally affects our future.

No longer are we isolated from world forces. We cannot be.

In World War II, we found that the enormously powerful tools of research and technology, teamed with our military efforts and organized in large-scale enterprises such as the Manhattan District atomic energy project made the difference between success and failure, and speeded up nuclear utilization at a fantastic rate. Following the war, as Senator Anderson could tell you far better than I, we had a great national debate about how the force of atomic energy the powers of science, would be employed in our democratic country.

Congress passed an Act which placed atomic energy development under a civilian agency, responsible for meeting military requirements, but specifying that efforts which would not violate security, would be applied through the Commission for the general welfare.

I cannot linger over the details, but the basic idea grew and by 1950 the National Science Foundation had been established and had moved steadily forward to support the general development of science.

Similarly, in 1958 the United States reached the climax of an extended debate about how to apply the capacity that the rocket gives us to go beyond the earth's atmosphere and outward for great distances into the expanse of the universe. One question was how this capacity could add to the knowledge of physics, astronomy, and all the other sciences.

A major change in outlook was involved. Technology was required as a basis for scientific study, technology of the highest level, to build rockets to carry out scientific investigations in space. We are trying to achieve a rocket vehicle whose structure and mechanical components will make up only five percent of the weight, allowing 95 percent for the fuel. That has not quite been achieved yet, but NASA is striving toward this goal. It requires the most advanced technology.

As rockets began opening up the vast reaches of space, people in all the sciences became interested in what the

implications would be for their particular areas. Initially, their interest was based on the work of the International Geophysical Year in which scientists of many nations participated in basic studies of the earth and its environment and in other fields where basic research was needed to extend human knowledge.

After long debate, in 1958 Congress passed the Space Act. The legislation set up an agency quite different from the old National Advisory Committee for Aeronautics, which formed its nucleus. The National Aeronautics and Space Administration continued NACA's role of research in aeronautics but expanded its space work and became an operating as well as a research organization. The Act assigned NASA a number of important tasks. I shall not itemize them because most of you are familiar with them.

I would like, however, to point out a significant factor. Here was a relatively unclassified agency that was instructed by law to prepare a long-rangeplan, was required to work with the nationals of other countries in cooperative endeavors to the fullest extent possible, was required to develop science and technology in areas promising early, direct applications -- such as communications satellites, navigation satellites,

meteorological satellites, as well as the technology growing out of this giant effort. Interestingly enough, a few years later, in 1961, another great debate resulted in the creation of an agency for arms control and disarmament. The legislation establishing the agency was closely modeled on the National Aeronautics and Space Act. It emphasizes the application of science and technology to help carry out this work which is so important to the future of the world.

The developments of the last 21 or 22 years -- beginning with the organized large-scale efforts in the war and continuing into the postwar period with the triumphs of our science and technology with, nevertheless, the growing knowledge that this capacity was not confined to our nation but that other nations could develop these same strengths -- were crystallized into national policy through our democratic process of debate, of public understanding, and of votes in the Congress. All of it is based on governmental investment of manpower, brain power, and resources to develop and exploit knowledge and technology at the most rapid rate possible and to utilize it in ways important to the Nation.

It is based on a continuation of large-scale organized effort with basic research as the essential underlying ingredient. It involves our universities in very important ways, and it involves development of means through which the resources of these universities can be utilized without diluting or weakening the basic requirements for the university as a continuing instrument in our society.

In the National Aeronautics and Space Administration, we are developing a program with universities that is based on strengthening the institution rather than on drawing off people into Government programs. This means graduate education must be closely linked with graduate research.

Also, we carry through as much of our program as possible by means of contracts with industry. It may interest you to note that an extremely large percentage -- some 90 or 92 percent -- of the funds the President is recommending for Fiscal Year 1963 will be spent in contracts with industry and other private organizations. The President's total recommendation is $3,787,000,000 for the National Aeronautics and Space Administration and something over $5,000,000,000 for the combined military, NASA, Atomic Energy, Weather Bureau,

and National Science Foundation programs in space. For these programs, two ideas go hand-in-hand -- that the Government must make sure that the effort is organized but that the resources and facilities are not created within the governmental structure.

What circumstances brought the President to make such a large recommendation in the 1963 Budget?

Under the Space Act, several groups of scientists and technicians were brought together in NASA. First were those from the old National Advisory Committee for Aeronautics which, over four decades, had rendered invaluable service to the Nation. Many of you may not realize that every plane serving in World War II gained added speeds of from 15 to 30 miles per hour thanks to one NACA research tool -- the full-scale wind tunnel. Nor is it well known that World War II submarines owed their ~~radically different and~~ greatly improved configurations to full-scale wind tunnel tests.

Thus, a key element has been the adaptation to space problems of the kind of organization that developed advanced technology for airplanes and submarines. The men who had the philosophy, the experience, skill, and dedication for the work were the foundation stones for the new organization.

Added to NACA personnel were such outstanding groups as that built up by the Army at Huntsville (the von Braun group), the staff of the Jet Propulsion Laboratory in California, and people from a number of activities associated with early missile and space projects.

The resulting NASA organization began with a budget of something less than $400,000,000 a year. The budget was expanded by the Eisenhower Administration to slightly more than a billion dollars, and was ~~largely~~ devoted to the long-term plan. The Eisenhower Administration's 10-year program would, by reasonable estimate, have cost about $23 to $25 billion. It would have provided for manned flight to the moon some time after 1970.

Now let us see how we come to the present situation. President Kennedy made a thorough examination of the goals, problems, and requirements for U.S. leadership in space. Bear in mind that many dramatic space events occurred rapidly in the first half of 1961, including the two Russian manned orbital flights. During that period, the Vice President and the Space Council thoroughly surveyed the U.S. space program, including careful consideration of whether there were to be

military missions in space. There was a determination on the part of the Secretary of Defense -- in my opinion a very courageous determination -- that even without military missions, we should proceed to build large boosters for the total benefit of the Government. Accordingly, a new 10-year program was worked out in which we were to spend approximately $35 billion, or some $10 to $12 billion more than had been contemplated under the previous 10-year plan. The new plan would achieve a lunar landing within the present decade, rather than project it into the period after 1970. It was determined that the U.S. must have a program that would overtake that of the Russians and accomplish along the way things in which the world could see benefits for all men -- a program that would give the Russians serious competition in the most important undertaking of all, manned lunar exploration.

The NASA program for Fiscal Year 1963, which you will read about in your newspapers tonight, carries with it the President's determination to mature the efforts begun under the Eisenhower Administration, expedited under the first Budget prepared by President Kennedy, and now gaining rapid headway.

It may interest you to know that while NASA will be nearly doubling its budget annually, the staff of the Agency is not being expanded in proportion. Over a three-year period we are increasing our personnel from roughly 17,000 people now to about 26,000 -- indicating how much work we are contracting to private organizations.

Now, briefly, what is in the accelerated national effort?

First, we have a very active flight program using the rocket vehicles to determine man's ability to move through the atmosphere out into space, to learn what we need to know about space itself and the return from space into the earth's atmosphere, and to gather information about the earth-sun phenomena which are so important in understanding the physical laws which govern the earth. You know the importance of the sun. Scientists such as Dr. Dryden could say more about that. I accept their judgment.

Our flight program in this area is based on such a large number of sounding rocket flights that I shall not attempt to enumerate them. In some periods, launchings averaged one for every working day. In addition, since 1958 the United States has successfully launched more than 60 major scientific satellites and deep space probes. Twelve

are still transmitting and 35 are still in orbit.

Against that background, we are proceeding with the maturing program for developing still larger multi-purpose vehicles for utilization in our space sciences program. There will be such large spacecraft as the Orbiting Astronomical Observatory, the Orbiting Solar Observatory, and the Orbiting Astronomical Observatory. Another type of space vehicle under development will draw power from the sun by means of solar cells and will store the energy. It will have telemetering equipment to handle a large number of experiments and transmit the data back to earth. It will be so versatile that on each launching it can carry into space entirely different sets of experiments, when this is desirable. For example, the Ranger, the first of a series of spacecraft for unmanned investigations of the moon, is called by the JPL staff a space "truck" because it can carry almost any kind of scientific cargo.

As can be seen, as the program is stepped up, the requirements will be enormous on our most brilliant scientists and on our universities to develop experiments that really teach us the new things we need to know.

In the field of applications, last year we began developing three major communications satellite concepts -- two designed for low orbits and one for high-altitude synchronous orbits. The first is Project Relay, financed by the Government, and the second is Project Telstar, completely financed by the American Telephone and Telegraph Company. The Syncom, or synchronous-orbit satellite, is financed by the Government and keys closely into military needs in connection with the Advent program, which is also a high-altitude synchronous satellite.

We will be working with the Navy also in connection with civilian utilization of the Transit satellite which has demonstrated that it has great value to our military services for navigation and which many believe will have wide commercial applications.

Another application that interests President Kennedy and which he is constantly putting forward -- and I believe Congressman Miller has talked with the President about it, from the tone of his speech -- is the leverage in the economy of $35 billion of scientific work performed over a 10-year period. Within that period, the nation will be expending some $700 billion on construction, and another three to four

hundred billion on maintenance and repair, making a total of a trillion dollars of construction, maintenance, and repair.

The leverage of 35 billion on a trillion dollars in a decade is stupendous. This should be kept in mind in considering the national aeronautics and space program in perspective.

Now I would like to turn to manned space flight. You know that next week we will approach the culmination of the Mercury program. Project Mercury has been of great significance to this Nation's world stature. It has been equally important in encouraging our young people to develop their potential in mathematics and in science and technology generally. As your Chairman mentioned, Mercury successfully tested our first spacecraft for manned flight, and we were able to orbit a talking robot and then send the chimapnzee Enos around the world.

Few people understand the size, scope, and sweep of such a program as Mercury. It seems so simple. One man in a one-man space ship orbiting the earth. But behind the project has been a vast and formidable effort in developing many new areas of technology. Brave and courageous men have devoted many, many hours to this program. It is a triumph for the

United States that we have gone as far as we have in the period. We are looking forward to great success with Astronaut John Glenn.

Following Glenn's flight, we expect ~~one~~ 9 Mercury launching every 60 to 90 days for several more flights. The Mercury one-man spaceship will be improved until it has the capability of 18 orbits, or one day of orbital flight.

To follow Mercury, we are developing Project Gemini, (named for the twin constellation Castor and Pollux). Gemini's flight program will be very much like that for the X-15. It will prove experimentally the things we need to know before we move into heavy expenditures for Project Apollo and the Advanced Saturn.

As you know, the Advanced Saturn is a very large rocket -- a launch vehicle whose cluster of five engines will deliver a total thrust of a million and one-half pounds. The first stage will generate approximately five times the power of Saturn which was test flown late last year and is still the largest known object that man has sent into space to date.

The Advanced Saturn will boost the three-man Apollo spacecraft, which will be capable of orbiting the earth, of

making a fly-by of the moon to investigate the moon's surface, radiation, and other of its phenomena -- and then returning into the earth's atmosphere at some 25,000 miles an hour. The Advanced Saturn will be able to place the Apollo spacecraft in orbit and also propel it on a lunar fly-by mission.

But even this giant Advanced Saturn will not have enough weight-carrying power to land Apollo on the moon and return it to earth. Therefore, we have an option. We can either join the payloads of two Saturns in orbit around the earth and thus build the spaceship to go to the moon, or we can construct a still larger launch vehicle -- the Nova, which would require roughly seven and one-half million pounds of thrust in the first stage. Nova would be powerful enough to carry some 150,000 pounds of payload to the moon by direct ascent from the earth's surface.

Obviously it will be a gigantic task to carry all these steps through, and all of it will be expensive. If it does prove possible to join two Advanced Saturn payloads in orbit around the earth -- a technique called "rendezvous" -- we can save about two years and a large amount of money. We shall develop and test this advanced experimental program with a

two-man spacecraft to find how long a man can remain in space, how he can adapt himself to weightlessness, how he can be returned safely into the gravitational field of the earth and take the stresses involved.

In order to develop the rendezvous technique, we shall be working with the Air Force to orbit an Atlas-Agena launch vehicle which will then be joined in orbit with the two-man spacecraft. The Agena will then become the engine for the spacecraft and will furnish power to maneuver it in space for many training and developmental manned flights. These two-man missions will go forward during the next few years. As all of you are aware, the project by its very nature will also be de veloping capability for military utilization, should that be required.

I should move on quickly to the area of advanced research and technology. As I have mentioned, among the most significant products returned from the national investment in this program, are assets such as our worldwide tracking and data acquisition network, our deep space network, our basic facilities through which the new generation of large launch vehicles and spacecraft can be manufactured in plants across the United States, brought together for fabrication outside

New Orleans near the mouth of the Mississippi River, tested at a site across the river in Mississippi, and then transported by water to Cape Canaveral, and launched.

The capacity of the Nation for progress, represented by these assets, and the brainpower and skills which will make it possible, will be required for a long time.

The next-to-last point I want to emphasize is that as we let large contracts to industry and place on the contracting firms the tasks, obligations, and responsibilities involved, we are proceeding prudently to test ~~such~~ programs as Gemini, ~~and each of its~~ major requirements for success. We are contracting in one-year increments so that we can speed up, slow down, or adjust the program as we learn from experiments as they go forward.

Finally, may I point out that from the beginning of the accelerated space program, the President emphasized that top officials of the Government must work together closely. He made it clear that he expected the Vice President and the Space Council to insist on this in every phase of the program. Thus, in the top echelons of government, an effective organization and pattern has been worked out.

The men who are being recruited to hold executive positions in the space program -- whether promoted from within the governmental structure or brought in from industry or the universities -- are, in my opinion, as outstanding a group as I have ever worked with. (And I have worked for organizations such as the Bureau of the Budget, the State Department, and several companies that I may say have substantial growth records ~~potentials.~~) Every American can be proud of the men contributing to the aeronautics and space program.

I would like to add that NASA relationships with the Department of Defense and the Military Services, with the Atomic Energy Commission and the Federal Communications Commission, beyond the areas of science and technology are also close, productive, and significant. We are all learning to work together, not only on the how-to-do-it basis, but on problems of what is worthwhile doing and on what kind of governmental policies should, for instance, be followed in regard to communications satellites and meteorological satellites.

The principle which the President enunciated and has insisted upon throughout is that the using agency must fund the program, be responsible for it, and utilize other agencies on something like a sub-contract basis.

All of us are quite aware that this presents problems for Congress. My good friend, George Miller has some rather serious problems. Jim Fulton, I know, is quite concerned. The structure of the Committees in Congress does not run exactly parallel with a decision of this nature.

I have no doubt that we will be able to work the problems out, but they do illustrate for you, I believe, the areas in which you would not normally expect to encounter difficulty when you are going to the moon.

Thank you very much.

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